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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,136	12/11/2003	Yiliang Wu	D/A3401	7393

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EXAMINER

TALBOT, BRIAN K

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 04/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/733,136	Applicant(s) WU ET AL.	
	Examiner Brian K. Talbot	Art Unit 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 26-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/11/03;10/25/04</u> . | 6) <input type="checkbox"/> Other: _____ |

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Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-25, drawn to a method of coating, classified in class 427, subclass 58+.
 - II. Claims 26-29, drawn to a device, classified in class 257, subclass 52+.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process other than coating such as laminating.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Zosan Song on 3/18/05 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-25. Affirmation of this election must be made by applicant in replying to this Office action. Claims 26-29 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.
5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the

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currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

6. Claims 1-29 remain in the application with claims 26-29 being directed toward a non-elected invention as detailed above. Hence, claims 1-25 are active in the application and claims 26-29 should be canceled in response to this Office Action.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 12, 16, 19 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 12, the claim is not further limiting. Claim 12 recites "solution coating" and independent claim 1 recites "solution depositing". Clarification is requested.

With respect to claim 16, the claim recites the broad recitations of thiol and amine and the claim also recites dithiol and diamine which are the narrower statement of the range/limitation. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired.

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Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

With respect to claims 19 and 20, the term "heating temperature" lacks antecedent basis. It is unclear whether the temperature being referred to is an "additional" heating step of the claimed heating step. Clarification is requested.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-17,19,20 and 24 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Schulz et al. (6,126,740).

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Schulz et al. (6,126,740) teaches a solution synthesis of mix-metal chalcogenide nanoparticles and spray deposition of precursor films. A colloidal suspension comprising metal-chalcogenide nanoparticles and a volatile capping agent (abstract). When deposited the colloidal suspension forms a substantially carbon-free precursor film with the volatile capping agent volatilizing instead of decomposing and being introduced into the film (col. 3, line 65 – col. 44, line 15). Mixed-metal chalcogenide nanoparticles can be used as well as single metal chalcogenide nanoparticles (col. 8, lines 20-35). The substrate is a soda-line glass. Heating to volatilize the capping agent is performed at below 200°C (col. 9, lines 15-25). Heating of the film causes fusion of the nanoparticles to produce a continuous film (col. 6, lines 55-65). The nanoparticles ranges from 1nm to 50 nm. The volatile capping agent includes amines, thiols, pyridine, etc. (col. 5, lines 45-55).

Claims 1-7,10-16 and 24 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Griffith et al. (6,348,295).

Griffith et al. (6,348,295) teaches method for manufacturing electronic elements by thin-film forming methods. Colloidal suspension of nanoparticles that exhibit electrical characteristics. The nanoparticles are surrounded by an insulative shell that may be removed by therefrom by application of energy including heating while the nanoparticles are fused (abstract). The layer may be a continuous film or a desired pattern. The size of the nanoparticles range from 1nm-999nm and may be conductive or semiconductive (col. 3, lines 10-20). The capping groups include amines thiols, pyridine, etc. (col. 3, lines 40-60).

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A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-7,10-20 and 25 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by Huang et al. “Plastic-Compatible Low Resistance Printable Gold Nanoparticle Conductors for Flexible Electronics”.

Huang et al. “Plastic-Compatible Low Resistance Printable Gold Nanoparticle Conductors for Flexible Electronics” teaches printable gold nanoparticle conductors on flexible electronics. A thiol-based encapsulant is used in the solution. Particles size of 1-5 nm. Heating temperatures of 140°C.

Claim Rejections - 35 USC § 103

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Griffith et al. (6,348,295) in combination with Schulz et al. (6,126,740) and Huang et al. "Plastic-Compatible Low Resistance Printable Gold Nanoparticle Conductors for Flexible Electronics".

Features described above are incorporated here.

Griffith et al. (6,348,295) in combination with Schulz et al. (6,126,740) fail to teach the substrate being a plastic or the conductivity of the layer.

Huang et al. "Plastic-Compatible Low Resistance Printable Gold Nanoparticle Conductors for Flexible Electronics" teaches applying gold layer on plastic substrates by nanoparticle suspensions.

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have a reasonable expectation of achieving similar results regardless of the substrate utilized. With respect to the conductivity, it is the Examiner's position that the conductivity is a "result effective variable" that is optimized through routine experimentation of one skilled in the art. It has been well settled that the mere optimization of known "result effective variables" is an obvious modification of the prior art absent a showing of criticality and/or unexpected results gleaned from difference.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 6AM-3PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

B-KT 4/15/05

Brian K Talbot
Primary Examiner
Art Unit 1762

BKT